C.9 Error and Status Message Files (Expected Results)

These files are generated on execution of Subsystem software.

Table C.9-1. Error and Status Message Files

File Name	Format	Description
LogReport_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	ASCII	Report Log
LogStatus_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	ASCII	Status Log
LogUser_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	ASCII	Log for user messages

C.10 Test Evaluation Software

None at this time.

C.7 Output Data Files (Production Results)

These files will be generated on execution of Subsystem software and are not included in the tar files.

Table C.7-1. Production Output Data

File Name	Format	Description
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd00	HDF	Hour 00 for day dd
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd01	HDF	Hour 01 for day dd
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd02	HDF	Hour 02 for day dd
...	...	...
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd22	HDF	Hour 22 for day dd
CER_BDS_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	HDF	24 Hours for day dd
CER_PRES8_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	Binary	24 hour Pre-ES8 for day dd

C.8 Output Temporary Data Files (Production Results)

There are no temporary files output by Subsystem 1.0.

C.6 Output Data Files (Expected Results)

Table C.6-1. Expected Output Data

File Name	Format	Description
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd00	HDF	Hour 00 for day dd (missing for this day)
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd01	HDF	Hour 01 for day dd
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd02	HDF	Hour 02 for day dd
...	...	...
CER_IES_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd22	HDF	Hour 22 for day dd
CER_BDS_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	HDF	24 Hours for day dd
CER_PRES8_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	Binary	24 Hour Pre-ES8 for day dd
CER_BINEL_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	ASCII	QC Command Error Log
CER_BINHS_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	ASCII	QC Command History Log
CER_BQCRP_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	ASCII	Production QC Processing Report
CER_BQCRPS_SamplingStrategy_ProductionStrategy_Configuration.yyyymmdd	ASCII	Instrument QC Statistics

Table C. 4-1. Ancillary Input Data (3 of 3)

File Name	Format	Description
Second_Time_Constant_Coefficients.19971212	ASCII	Input file for radiance count conversion
TRMM_ED9D_OR_yyyy-mm-ddT00-00-00Z_V01.nat	Binary	TRMM Ephemeris File
TRMM_G500_LZ_yyyy-mm-ddT00-00-00Z_V01.DAT1.nat	Binary	TRMM Attitude File
earthfigure.dat	ASCII	Earth Geoid Models

C.5 Primary Input Data (Expected Results)

Table C.5-1. Primary Input Data

File Name	Format	Description
TRMM_G054_LZ_yyyy-mm-ddT00-00-03Z_V02.DAT1	Binary	Level-0 instrument data
TRMM_G054_LZ_yyyy-mm-ddT00-00-03Z_V02.SFDU	ASCII	Level-0 instrument header data

Table C. 4-1. Ancillary Input Data (2 of 3)

File Name	Format	Description
EOS_PM2_Offsets.Normal_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM2_Offsets.Normal_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM2_Offsets.Short_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM2_Offsets.Short_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM3_Offsets.Normal_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM3_Offsets.Normal_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM3_Offsets.Short_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM3_Offsets.Short_RAPS.19971212	ASCII	Input file for radiance count conversion
TRMM_Offsets.Normal_FAPS.19971212	ASCII	Input file for radiance count conversion
TRMM_Offsets.Normal_RAPS.19971212	ASCII	Input file for radiance count conversion
TRMM_Offsets.Short_FAPS.19971212	ASCII	Input file for radiance count conversion
TRMM_Offsets.Short_RAPS.19971212	ASCII	Input file for radiance count conversion
Elevation_Scan_Offsets.file	ASCII	Elevation offsets used in elevation conversion
Instrument_Config_Logic_Table.file	ASCII	Overall instrument configuration logic table
Instrument_Engineering_Limits.file	ASCII	Provide instrument specific engineering parameter edit limit values
MAM_Configuration_Logic_Table.file	ASCII	Configuration logic table for MAM
Main_Cover_Configuration_Logic_Table.file	ASCII	Look-up table for Main-Cover
Offset_Equation_Coefficients.19971212	ASCII	Input file for radiance count conversion
Radiance_Edit_Limits.19971212	ASCII	Input file for radiance count conversion

C.4 Ancillary Input Data

Table C. 4-1. Ancillary Input Data (1 of 3)

File Name	Format	Description
Analog_Location.file	ASCII	Location of all Analog Parameters in data stream
Digital_Location.file	ASCII	Location of all Digital Parameters in data stream
EOS_AM1_Offsets.Normal_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM1_Offsets.Normal_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM1_Offsets.Short_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM1_Offsets.Short_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM2_Offsets.Normal_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM2_Offsets.Normal_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM2_Offsets.Short_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM2_Offsets.Short_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM3_Offsets.Normal_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM3_Offsets.Normal_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM3_Offsets.Short_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_AM3_Offsets.Short_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM1_Offsets.Normal_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM1_Offsets.Normal_RAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM1_Offsets.Short_FAPS.19971212	ASCII	Input file for radiance count conversion
EOS_PM1_Offsets.Short_RAPS.19971212	ASCII	Input file for radiance count conversion

Table C.2-1. Control Files (2 of 2)

File Name	Format	Description
MCF_BDS	ASCII	Metadata Configuration File for Science BDS
MCF_IES	ASCII	Metadata Configuration File for IES
MCF_BIN	ASCII	Metadata Configuration File for Binary Files
MCF_CMH	ASCII	Metadata Configuration File for Command History Files
MCF_PRES8	ASCII	Metadata Configuration File for Pre-ES8
MCF_QCR	ASCII	Metadata Configuration File for QC Files
MCF_BDF	ASCII	Metadata Configuration File for Diagnostic Fixed Pattern BDS
MCF_BDG	ASCII	Metadata Configuration File forDiagnostic Gimbal Error BDS
MCF_BDP	ASCII	Metadata Configuration File forDiagnostic Processor BDS
MCF_BDM	ASCII	Metadata Configuration File forDiagnostic Memory Dump BDS

C.3 Production Makefiles

None

Appendix C
File Description Tables

C.1 Production Scripts and Executables

Table C.1-1. Production Scripts and Executables

File Name	Format	Description
run_main.csh	ASCII	C-Shell script which executes Main Processor
main_control	Binary	Instrument executable
instr_pcf_gen.csh	ASCII	C-Shell script which creates Level-0 PCF file
quick_pcfin_gen.csh	ASCII	PCF generator that takes the output file from quicklook_input_find.csh as input to create the PCF
instr_input_find.csh	ASCII	C-Shell script which generates the PCF generator input file for Level-0 data
INSTRUMENT_env.csh	ASCII	C-Shell script which sets up instrument environment
instr_pcfin_gen.csh	ASCII	PCF generator that takes the output file from instr_input_find.csh as input to create the PCF
quicklook_input_find.csh	ASCII	C-shell script which generates the PCF generator input file for quicklook data

C.2 Processing Control Files (PCF), Metadata control Files (MCF), and Status Message Files(SMF)

The Process Control Files included in the Software Delivery Package are listed in Table B.2-1. Subsystem 1.0 Status Message Files are located in /CERES/instrument/smf.

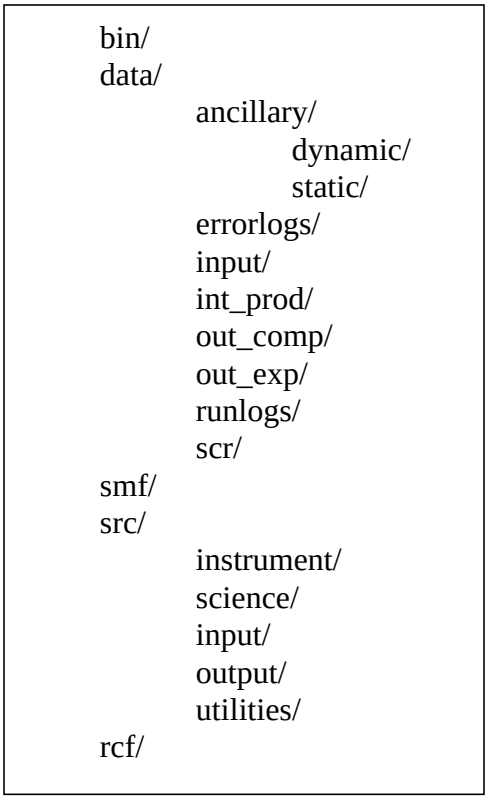
Table C.2-1. Control Files (1 of 2)

File Name	Format	Description
MCF_BDC	ASCII	Metadata Configuration File template for Calibration BDS
MCF_BDD	ASCII	Metadata Configuration File for Diagnostic No Archive BDS

APPENDIX C
File Description Tables

Appendix B
Directory Structure Diagram

Directory /CERES/instrument/



APPENDIX B
Directory Structure Diagram

Appendix A
Acronyms and Abbreviations

ASCII	American Standard Code Information Interchange
BDS	BiDirectional Scan
CCSDS	Consultative Committee for Space Data Standards
CERES	Clouds and the Earth's Radiant Energy System
CERESlib	CERES library
DAAC	Distributed Active Archive Center
DMS	Data Management System
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
HDF	Heirarchical Data Format
IES	Instrument Earth Scans
IPS	Instrument Processing System
LaTIS	Langley TRMM Information System
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
MCF	Metadata Configuration File
QA	Quality Assurance
SCF	Science Computing Facility
TRMM	Tropical Rainfall Measuring Mission

APPENDIX A
Acronyms and Abbreviations

References

1. Toolkit User's Guide for the ECS Project, November 1996.
2. CERES Data Management System Data Products Catalog (DPC), Release 2, Version 1, January 1997

4.0 Test and Evaluation Procedures

This section provides general information on how to execute Subsystem 1.0 and provides an overview of the test and evaluation procedures. It includes a description of what is being tested and the order in which the tests should be performed.

4.1 Stand Alone Test Procedures

See $CERESHOME/instrument/rcf/README under "CM AND SSIT TESTING", "Stand Alone Test Procedures" for instructions.

4.2 Normal Operating Procedures

Before CERES Subsystem 1.0 can be executed in production, Level-0 data must be available and the corresponding Ephemeris and Attitude Files must be successfully run through DPREP. Twenty-four hours of data are run at a time.

4.3 Evaluation Procedures

4.3.1 Exit Codes

0 - Normal Exit,
200 - Error in Main Processing,
203 - Error creating Pre-ES8.

4.3.2 Log and Status File Results

The Error and Status Log file, LogReport, will be located in directory "$CERESHOME/instrument/data/runlogs" after CERES Subsystem 1.0 has been executed.

4.3.3 Execution of Comparison Software

No comparison software at this time.

4.3.4 Optional evaluation procedures

See $CERESHOME/instrument/rcf/README under "CM AND SSIT TESTING", "Optional Evaluation Procedures" for instructions.

4.4 Solutions to Possible Problem

3.0 Software and Data File Installation Procedures

This section describes how to install the Subsystem 1.0 Instrument software in preparation for making the necessary test runs at the Langley DAAC. The installation procedures include instructions for uncompressing and untarring the delivered tar files, properly defining environmental variables, and compiling the Instrument programs.

3.1 Installation

Software/Data File Install Procedure:

See $CERESHOME/instrument/rcf/README under "CM AND SSIT TESTING", "Installation" for instructions. SCCR# = 62.

3.2 Compilation

See $CERESHOME/instrument/rcf/README under "CM AND SSIT TESTING", "Compilation Instructions" for Instructions.

2.0 Test Environment

2.1 External Interface

The CERES input data provided for Subsystem 1.0 testing consists of Level-0, Ephemeris, and Attitude data files from the TRMM simulation #3. There are no simulated data. This Subsystem does not use CERESlib.

2.2 Directory Structure and File Descriptions

The CERES Instrument Geolocate and Calibrate Earth Subsystem 1.0 Release 2, TRMM Launch delivery package will contain four compressed tar files: instrument_src_R2-062.tar.Z, instrument_data_R2-062.tar.Z, instrument_anc_R2-062.tar.Z, and instrument_test_plan_R2-062.tar.Z. The directory structures are shown in Appendix B. The contents of the tar files are categorized according to software files, ancillary data, input and output data files, and the test plan. A description of each file, except the source code, included in this delivery package can be found in the tables in Appendix C.

1.2 Subsystem Overview

The Instrument Processing Subsystem (IPS) is the first subsystem of the CERES Data Management System (DMS). The purpose of the IPS is to process raw spacecraft and sensor telemetry data into output data products for use in subsequent processing by other CERES DMS subsystems. IPS processing of raw spacecraft and sensor telemetry data can be broken down into the following three major functions:

1. Conversion of:
   a) instrument detector outputs (counts) into filtered radiance values
   b) instrument analog and digital housekeeping data into engineering units
2. Geophysical location of each sample of data
3. Quality Assessment (QA) and data validation checks to ensure integrity and quality of the IPS data output products

The primary data input for the IPS is called the Level-0 file, which is actually several physical files represented as a single virtual file by the ECS Toolkit (Reference 1). The Level-0 file contains chronologically ordered data packets, where each packet corresponds to a single scan of the instrument. The format of these packets conforms to the Consultative Committee for Space Data Standards (CCSDS) communication protocol and provides for packet elements such as headers, footers, and QA flags, in addition to the primary instrument detector and housekeeping output data. Under most conditions, a typical Level-0 file will contain 24 hours of instrument detector and housekeeping data. In addition to the Level-0 file, other input files are required to support the functions of data conversion, geolocation, and QA/validation. Examples of these secondary input sources or ancillary files include the Ephemeris Data File, Attitude Data File, and Instrument Coefficients File.

The expected results of the IPS processing of a Level 0 file are two sets of output products: the BiDirectional Scan (BDS) file and the Instrument Earth Scan (IES) files. The BDS file is an archivable product which contains 24 hours of data that corresponds to the 24-hour period of the Level-0 input file. The BDS file contains all of the raw analog and digital instrument data from the Level-0 file as well as converted values (radiances and engineering units) and corresponding quality flags. The specific data parameters contained within the BDS have been defined in the CERES DMS Data Products Catalog (Reference 2). The BDS file serves as an input product for the DMS ERBE-Like Subsystem.

The IES output product is a collection of 24 1-hour data files which normally cover the corresponding 24-hour time period of the Level-0 file. As with the BDS file, the specific data parameters contained in an IES file are defined by the CERES DMS Data Products Catalog (Reference 2). Unlike the BDS file, IES files are considered internal to the CERES DMS and are not archived. IES files do not contain any raw or unconverted instrument detector data, nor do they contain any instrument housekeeping data (raw or converted). The primary data elements in an IES file are geolocated radiance values which are sorted temporally and spatially into data subset units called footprints (a set of geolocated (colatitude, longitude) set of detector radiance values). This sorting of data into footprints is a necessary function in order to support processing by the DMS Cloud Convolution Subsystem which is the primary user of the IES products.

1.0 Introduction

The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS). The CERES instruments are improved models of the Earth Radiation Budget Experiment (ERBE) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as ERBS, was successfully developed in ERBE to reduce time sampling errors. CERES will continue that strategy by flying instruments on the polar orbiting EOS platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation, and to improve the consistency between the cloud parameters and the radiation fields, CERES will include cloud imager data and other atmospheric parameters. The first CERES instrument is scheduled to be launched on the TRMM spacecraft in 1997. Additional CERES instruments will fly on the EOS-AM platforms, the first of which is scheduled for launch in 1998, and on the EOS-PM platforms, the first of which is scheduled for launch in 2000.

1.1 Document Overview

The Release 2 delivery Test Plan to the Langley DAAC for the CERES Instrument Geolocate and Calibrate Earth Radiances Subsystem 1.0 consists of tar files and documentation describing the data and software contained in the tar files.

The tar files contain the CERES Instrument Geolocate and Calibrate Earth Radiances Subsystem Release 2 software and the ancillary data sets required for the software to execute. The tar files also contain output data files that were generated on the Science Computing Facility (SCF), thunder.

This document, the CERES Instrument Geolocate and Calibrate Earth Radiances Subsystem 1.0 Release 2 Test Plan, provides a description of the Release 2 software and supporting data files and explains the procedures for installing, executing, and testing the software. A section is also included on validating the results of executing the software.

The document is organized as follows:

LIST OF TABLES

TABLE OF CONTENTS

Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

CERES Instrument Geolocate and Calibrate Earth Radiances Subsystem 1.0

Release 2 Test Plan
TRMM Launch
Version 2

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